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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Opening Device on a Pack for Liquids

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Notice: This application is as filed and may therefore contain an incomplete specification.



Abstract

Opening device on a package for flowable media

5 An opening device externally fitted to the top surface (1) of a package is described, with a lower part (3) which is provided with an approximately annular welding flange (4), and a sealing part (6) moveable relative thereto, with the aid of which a sealing area (10) of the top surface can be torn away for opening.

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 In order that the opening device can be manufactured more simply from a technical point of view and more inexpensively, and can be opened more easily and re-closed properly, it is provided according to the invention that the lower part (3) is provided inside the welding flange (4) with an approximately
15 annular tearing edge (16) narrowing downwards towards the sealing area (10), and the sealing part (6) is configured approximately cup-shaped and its base (8) can be arranged inside the tearing edge (16) and is sealed by the sealing area (10).

20 Figure 5

Opening device on a package for flowable media

5 The invention relates to an opening device fitted externally to the top surface of a package, with a lower part which is provided with an approximately annular welding flange and a sealing part which is movable relative thereto, with the aid of which a sealing area of the top surface can be torn away for opening.

10 There are numerous opening devices on packages, which are provided with a lower part which is welded onto the top surface of the package and is provided via a hinge with a sealing part which is provided, downwards and inwards from its external plane, with an annular collar with a toothed contour or a projecting needle. For opening, the sealing part is pushed into the top
15 surface of the package, whereby the needles or toothed contour pierce a pre-fabricated opening to make a pouring hole.

In another, previous, opening device, in the area of the sealing area the top surface has externally a weakening and pre-determined breaking line, which
20 is broken when the sealing part is pressed down, wherein the sealing area remains attached to the sealing part and is pulled up when folded up to form the pouring aperture.

These known opening devices are limited on the one hand to the opening of
25 packages made from composite materials with coated paper, and also the material punched out has to be removed. Until now, to make the pouring aperture in a foil bag, a hole was punched in the foil, with the disadvantage that there was wear and tear of the punching blades and valuable time and transport distances were wasted. Furthermore, the opening device had to be
30 positioned very accurately on the pre-punched hole so that the opening device could work successfully.

The object of the invention is therefore to improve an opening device of the type described in the introduction such that it can be manufactured more simply from a technical point of view and more cheaply, and can be fitted on packages and opened more easily and is easily re-closable.

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This object is solved according to the invention with respect to the opening device according to the type described in the introduction, in that inside the welding flange, the lower part is provided with an approximately annular tearing edge, narrowing downwards towards the sealing area, and the sealing
10 part is configured approximately cup-shaped, and can be arranged with its base inside the tearing edge, and is sealed by the sealing area. The cup-shaped configuration and the base of the sealing part sits not only inside the annular configured lower part, but also inside the tearing edge of the lower part and is sealed over the base to the sealing area, that is to say the part of
15 the top surface which will be torn out for opening and forms the pouring hole. By sealing, the sealing area is not only torn out so that the pouring aperture can form, but also the sealing area remains attached to the base and is removed when the sealing part is taken away without falling in to the inside of the package in an undesirable manner or having to be removed from the
20 outside.

The new opening device according to the invention is preferably fitted onto packages for flowable media, and is particularly suitable in this case for working in an area of the package where it is composed only of foil. There are, for example bag packages which were in general difficult to close or
25 difficult to open. By means of the opening device according to the invention, both of these have been simplified. In the area of its pouring aperture, the foil bag does not have to be worked, the top surface of the package does not have to be weakened or even opened, but rather the new opening device is welded, by means of the welding flange of the lower part, externally onto the
30 place on the plastics foil where the pouring aperture will be required later.

Unlike the known opening devices, according to the invention a tearing edge is configured on the lower part and inside the welding flange. The tearing edge narrows downwards towards the sealing area of the top surface which will be torn out later. When the user takes hold of the sealing part for opening, and pulls it out of the lower part, the sealing area is pulled over the tearing edge so that the sharp edges thereof tear the plastics, preferably according to the configuration of the pouring edge.

Furthermore, it is advantageous according to the invention when the base of the sealing part is continuously sealed to the sealing area at a radially small distance of only a few millimetres, preferably 1 mm to 5 mm away, inside the tearing edge, and approximately parallel to the tearing edge.

Through these measures, the tearing point lies very close to the holding and welding points. Undesirable stretching of the plastics foil is avoided. Too much stretching would make satisfactory tearing of the foil in the area of the tearing edge difficult. Additionally, stretched areas of the foil would project like flaps into the pouring aperture and interfere with pouring. Tearing is facilitated by the arrangement of the welding and holding areas at a small distance outside and inside the tearing edge.

It is furthermore advantageous according to the invention when the sealing part has a sealing casing, which in the closed position engages with an external sealing surface of the tearing edge, forming a sealing face. Such an opening device guarantees not only easy opening but can also be re-closed in a functionally efficient manner. The cup-shaped part of the sealing part terminates radially in a sealing casing which is engaged in a sealing manner with the tearing edge. The contour, or curvature of the sealing casing on the one hand and the outer sealing surface of the tearing edge on the other hand are configured preferably similarly or approximately the same, so that the cup-shaped part and its sealing casing can be pressed by simple pressing in of

the sealing part into the lower part into the space inside the tearing edge so that a sealing face is produced, which is produced on the one hand externally on the sealing casing and on the other inside on the so-called external sealing surface of the tearing edge.

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It is also advantageous when according to the invention, the lower part is provided with a pouring flange, extending approximately parallel to the welding flange, forming an outwardly open radial retaining groove. Externally, the lower part has a collar, running approximately parallel around the annular
10 tearing edge, which together with the welding flange on one side, and at an axial distance therefrom the pouring flange on the other side, forms the retaining groove mentioned above. This retaining groove is correspondingly annular and makes it possible to optionally insert the opening device into more rigid retaining elements, for example when the opening device has to be fitted
15 onto a package, the top surface of which is composed of composite material, where only the area of the future pouring aperture is made without support material, and only from plastics foil. In this case, the support material would act as a stiffener and pass, at least partially, from the outside into the groove in order to further facilitate the tearing or tearing out of the sealing area.

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The entire surface of the welding flange can be sealed, as is also possible in the plate-shaped area of the base of the sealing part. If, alternatively one wishes to weld the opening device according to the invention to the plastics foil on the top surface by ultrasound, it is then preferable to provide
25 approximately annular ribs projecting downwards towards the top surface, instead of welding the entire surface. Such annular ribs then serve as energy guides for the ultrasound welding. Clearly, several ribs of the presently described type can be arranged at a distance apart and parallel to one another.

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In a further embodiment of the invention, the top surface of the pouring flange

goes over the outer sealing surface of the tearing edge in the manner of a funnel, wherein the tearing edge is preferably provided with a toothed contour. On the one hand, pouring is improved, and on the other hand the pouring stream is better defined by the funnel shape of the pouring flange, wherein the
5 incline of the funnel is then configured eccentrically at the front at the pouring edge, and can be more strongly defined than in the other area of the funnel shaped transition. The funnel-shaped transition from the pouring flange to the outer sealing surface of the tearing edge mentioned further facilitates the insertion of the cup-shaped part when the sealing part presses into the lower
10 part.

It is advantageous, for example, when the whole opening device is manufactured by injection moulding, in the open position, and prior to welding onto the top surface of the package the sealing part is pushed into the lower
15 part. In this way the opening device can be pre-fabricated and stored in magazines without a large space requirement, from which they can later be taken and applied to a package.

The toothed contour of the tearing edge further facilitates the opening of the
20 package as when the tearing edge is pulled up, the tearing forces occur particularly at the points of the teeth and keep the undesirable stretching of the material to a minimum.

It is further advantageous when the sealing part is provided with a parallel and
25 planar covering flange which can be laid on the pouring flange of the lower part, which externally surrounds the sealing casing. The opening device according to the invention is in this way given stability when the sealing part is pressed into the lower part, that is to say in the position before the initial opening or subsequently in the re-closed position.

30 It is also particularly advantageous when according to the invention the

sealing-part is provided with a tear ring connected by means of a fixing tab, which preferably is provided with an authentication tab. The attachment of tear rings on sealing parts in the case of opening devices is indeed commonly known in itself. By attaching the fixing tab, however, a point is created where the use of force for the initial opening results in over-stretching of the tab and is also consciously designed in this way. The result of such over-stretching is that the tear ring no longer lies flat in its original position parallel to the covering flange after initial opening. The user can then see immediately that the opening device has already been used, and probably been opened. This is particularly noticeable when it is ensured that the fixing tab mentioned is more strongly over-stretched on the radially inner side towards the centre of the approximately plate-shaped wall of the base than outside, whereby the tear ring remains standing at an angle after initial opening.

Circular rims and plates are certainly the simplest and cheapest to manufacture from a technical point of view. It is, however, also conceivable that the tearing edge together with the wall surrounding it can be configured oval, polygonal or the like, rather than cylindrical or exactly conical. This also applies to the cup-shaped part of the sealing part.

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Furthermore, according to the invention, in a preferred embodiment the sealing part can join the sealing part to the lower part with a hinge connection. As with different known opening devices, the sealing part and the lower part can, in the particularly preferred embodiment, be connected by means of the hinge connection. This is, however, in no way necessary for obtaining the advantages and measures according to the invention. It is indeed quite possible to manufacture the sealing part separately by injection moulding and later to connect it to the lower part by a snap connection. The covering flange of the sealing part could be provided with an internally conically configured ring, which could be pressed over the pouring flange of the lower part using slight stretching, so that it then grips underneath the pouring flange and in this

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way joins the sealing part firmly to the lower part. With this second embodiment, opening could be done by breaking open pre-determined break lines, wherein the ring mentioned on the sealing part, gripping underneath pouring flange, then serves as a hinge connection.

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Further advantages, features and possibilities for use of the present invention will become apparent from the following description of preferred embodiments with reference to the attached drawings. These show, in:

10 Figure 1 the cross-section view of an opening device of a first embodiment welded onto the top surface of a plastics bag, in a position not yet opened,

Figure 2 the same opening device as in Figure 1, but after opening,

Figure 3 in perspective, the plan view of the opening device of Figure 1,

15 Figure 4 a cross-section view similar to Figure 1, wherein however a second, different embodiment is shown welded to a bag package,

Figure 5 a cross-section similar to Figure 2, wherein the opened position of the second embodiment is shown,

Figure 6 a perspective view of the opening device according to the second
20 embodiment in the still unopened position, similar to Figure 3, and

Figure 7 a plan view of the opening device of the second embodiment after removal of the sealing part.

The opening device, generally labelled 2, is welded onto the top surface 1 of
25 a bag package, which is not shown; the lower part 3 over the welding flange 4 onto annular, projecting ribs 5 parallel and a distance apart, forming energy guides, and the closing part 6 over the sharp-edged ring 7, in the first embodiment according to Figures 1 to 3. This sharp-edged 7 also extends in a rib-like manner downwards and inwards towards the top surface 1 of a bag
30 package made from plastics foil, and is configured as an annular ring. This sharp-edged ring 7 runs externally along the periphery of the base 8,

extending the cylindrical sealing casing 9. Inside this sharp-edged annular ring 7 a sealing area 10 is formed in this way, which in Figures 2 and 5 is shown torn away.

- 5 In the embodiment according to Figures 4 to 7, there are no rib-like or other sharp-edged rings, which are necessary as energy guides for ultra sound welding. In the second embodiment according to Figures 4 to 7, the whole surface of both the welding flange 4 and the base 8 of the sealing part 6 is welded to the top surface 1 made from plastics foil.

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- The lower part 3 has, in both embodiments according to Figures 1 to 3 on the one hand and Figures 4 to 7 on the other hand, a collar 11 moulded radially onto the inside of the welding flange 4, which in the case here, of a circular opening device 2, is in the shape of a cylinder. This collar rises upwards from the radial inside end of the welding flange 4, approximately vertically from the top surface 1 by just a small amount, for example 1 to 15 mm, preferably 2 to 10 mm, and terminates at the outer upper end in a pouring flange 12, the inclined pouring surface 13 of which is clearly recognisable in Figures 2 and 5. It can also be seen in the opened position in Figure 7 at the front, wherein externally, the pouring edge is labelled 14. A retaining groove 15 is formed between the welding flange 4 and the covering flange 12, which completely surrounds the lower part 3.

- A tearing edge 16 is moulded onto the side of the collar 11 opposite the retaining groove 15. This narrows downwards and inwards towards the top surface 1, so that it terminates at the bottom in a sharp edge which, in the second embodiment according to Figures 4 to 7 is annular and flat, and in the first embodiment in Figures 1 to 3 is annular with a toothed contour 17. The base of the tearing edge 16 is the thicker part and is located approximately on the outer upper part of the collar 11, on its radial internal side. The so-called sealing surface 18 of the tearing edge 16 can be seen particularly

clearly in the open position in Figures 2 and 5. In the closed position in Figures 1 and 4, this outer sealing surface 18 lies on the sealing casing 9 of the sealing part 6 so that a sealing surface 19 is produced in between them (Figures 1 and 4).

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The sealing part 6 is composed of the cup-shaped part with the base 8 and the sealing casing 9, on the top end of which an annular covering flange 20, extending radially outwards, is moulded.

- 10 A fixing tab 21 is moulded on the side of the sealing part 6 lying in the proximity of the pouring edge 14, which is provided for the fixing of a tear ring 22. The latter is provided with an authentication tab 23 (tamper proof) on the side opposite the fixing tab 21. This configuration of the tear ring 22 with a stretchable fixing tab 21 is shown by means of the first embodiment according to Figures 1 to 3.

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The second embodiment according to Figures 4 to 7 is configured somewhat differently. In this case the gripping outer ring of the sealing part 6 and the covering flange 20 can be seen in Figure 6, in which, in the area of the pouring edge 14, two straight pre-set break lines 24 define the authentication tab. After pulling up the tear ring 22, the pre-set break lines 24 are broken open, and the fixing tabs 21 are stretched. When, after opening, the sealing part 6 is removed, the lower part 3 can be seen according to Figure 7, with the pouring aperture 25 which lies inside the tear line 6, shown corrugated, on the edge of the sealing area 10.

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The opening device 2 according to both embodiments is preferably manufactured so that the lower part comes to lie so to speak "completely folded back by 180°" adjacent the sealing part. After removal from the mould, this injection moulded opening device 2 is closed so that the position in Figures 1, 3 and 4, 6 is produced. This opening device can be stored or be

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welded immediately in the manner shown onto the package for flowable media.

5 For opening, the user takes hold of the tear ring 22, breaks open either the authentication tab 23 or the two pre-set break lines 24, pulls up the tear ring 22, stretching the fixing tab 21, and thereby removes the sealing area 10 of the plastics foil together with the base 8 to which it is welded. The pouring aperture 25 can now be seen, the package is open and the contents can be poured out.

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After partial emptying of the package, the opening device can be re-closed. For this, the sealing part is folded along the hinged connection 27, and in this way inserted in the lower part 3, so that the cylindrical sealing casing 9 of the sealing part 6 comes into sliding and then sealed engagement with the
15 external sealing surface 18 of the tearing edge 16, so that a sealing surface 19 is formed which according to a preferred embodiment is fluid tight.

List of designations

	1	top surface
	2	opening device
5	3	lower part
	4	welding flange
	5	ribs
	6	sealing part
	7	ring
10	8	base
	9	sealing casing
	10	sealing area
	11	collar
	12	pouring flange
15	13	pouring surfaces
	14	pouring edge
	15	retaining groove
	16	tearing edge
	17	contour
20	18	sealing surface
	19	sealing face
	20	covering flange
	21	fixing tab
	22	tear ring
25	23	authentication tab
	24	pre-set break lines
	25	pouring aperture
	26	tear line
	27	hinge connection
30		

Claims

1. An opening device (2) attached externally to the top surface (1) of a package, with a lower part (3) which is provided with an approximately annular welding flange (4), and a sealing part (6) moveable relative thereto, with the aid of which a sealing area (10) of the top surface can be torn away for opening, characterised in that the lower part (3) is provided inside the welding flange (4) with an approximately annular tearing edge (16) narrowing downwards towards the sealing area (10), and the sealing part (6) is configured approximately cup-shaped and its base (8) can be arranged inside the tearing edge (16) and is sealed by the sealing area (10).

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2. Opening device according to claim 1, characterised in that the base (8) of the sealing part (6) is continuously sealed to the sealing area (10) at a small radial distance of only a few millimetres, preferably 1 mm to 5 mm, from the tearing edge (16, 17) inside and approximately parallel to the tearing edge (16, 17).

15
3. Opening device according to claim 1 or 2, characterised in that the sealing part (3) has a sealing casing (9), which in the closed position is engaged with an external sealing surface (18) of the tearing edge (16), forming a sealing surface (19).

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4. Opening device according to one of claims 1 to 3, characterised in that the lower part (3) is provided with a pouring flange (12) extending parallel to the welding flange (4), forming a radial, outwardly open retaining groove (15).

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5. Opening device according to one of claims 1 to 4, characterised in that the top surface of the pouring flange (12) merges in a funnel-

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like manner into the outer sealing surface (18) of the tearing edge (16), wherein the tearing edge (16) preferably has a toothed contour (17).

- 5 6. Opening device according to one of claims 1 to 15, characterised in that the closing part (6) is provided with a covering flange (20) which can be laid parallel and planar on the pouring flange (12) of the lower part (3), which externally surrounds the sealing casing (9).
- 10 7. Opening device according to one of claims 1 to 6, characterised in that the sealing part (6) is provided with a tear ring (22) connected by means of a fixing tab (21), which is preferably provided with an authentication tab (23).
- 15 8. Opening device according to one of claims 1 to 7, characterised in that the sealing part (6) is joined to the lower part (3) with a hinged connection (27).

Fig. 1

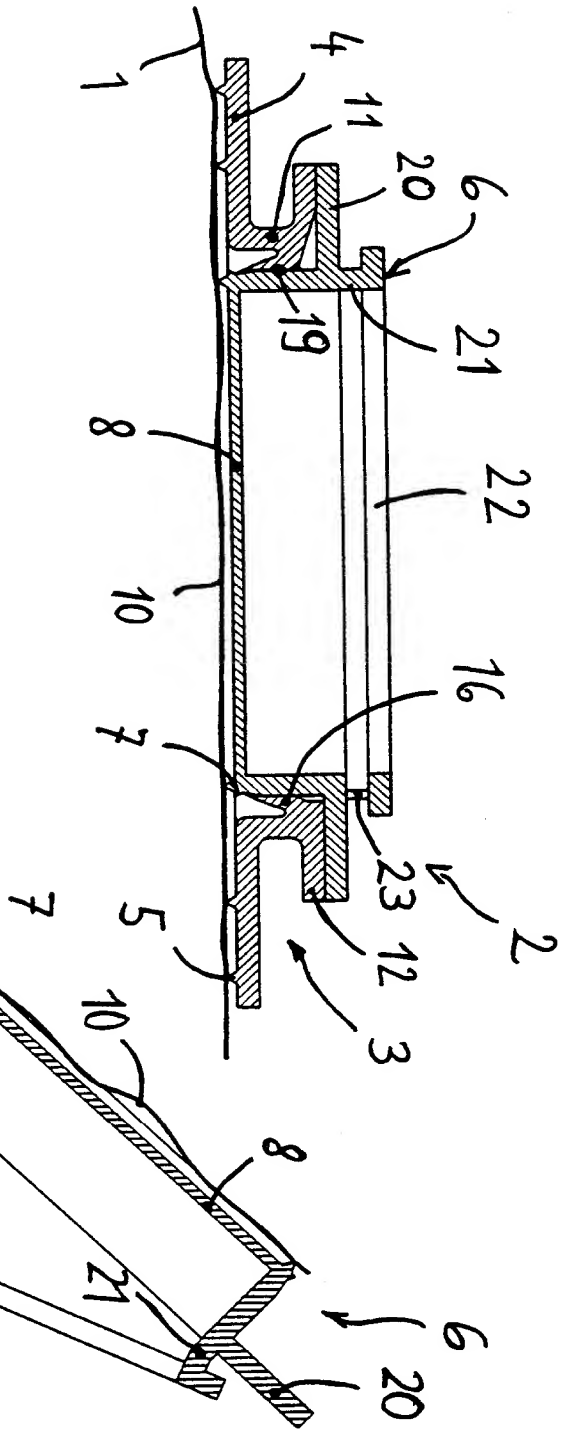
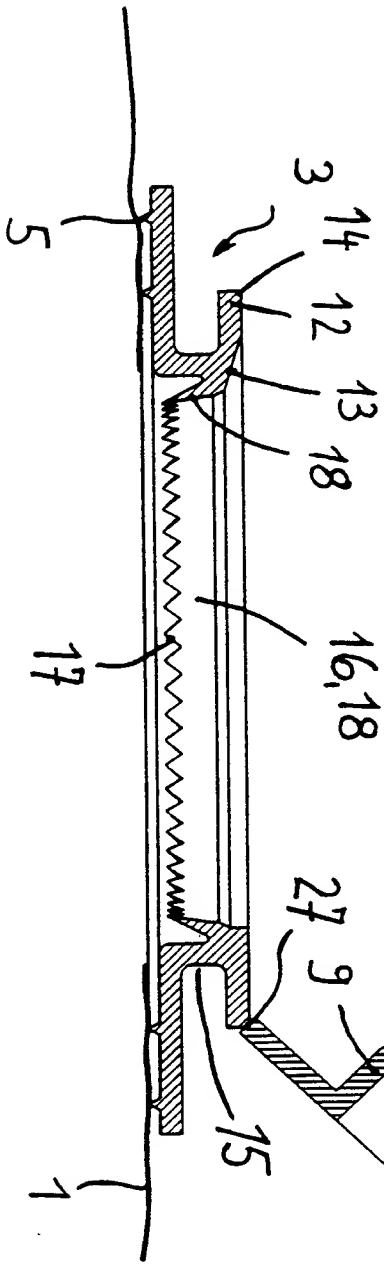


Fig. 2



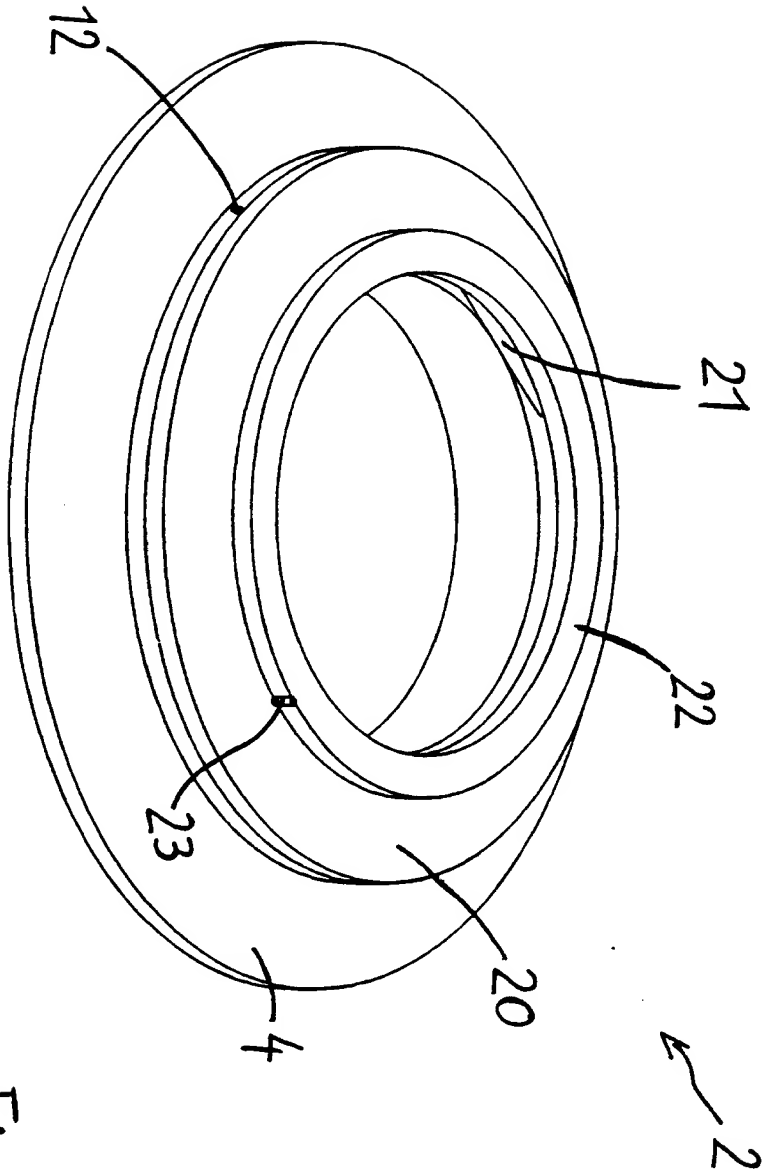


Fig. 3

Fig. 4

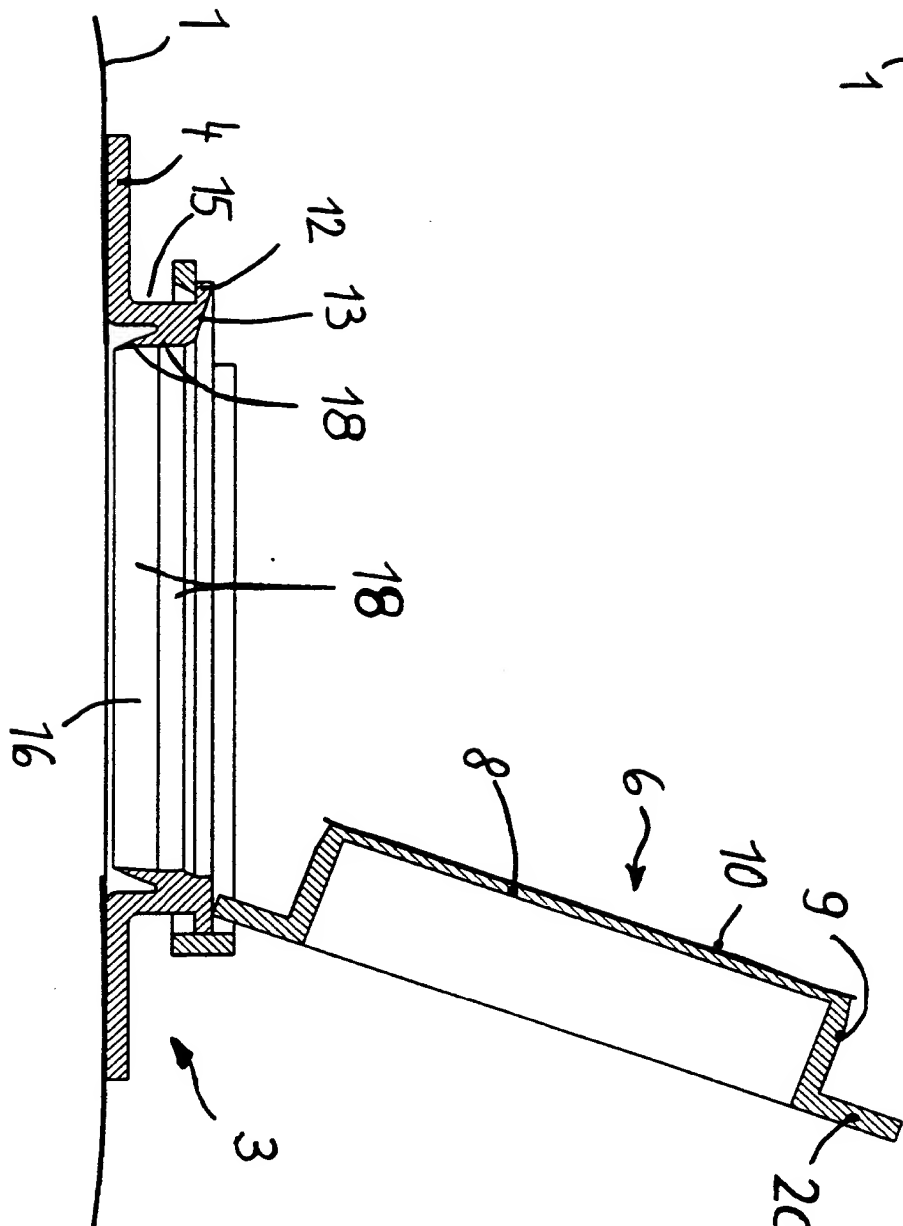
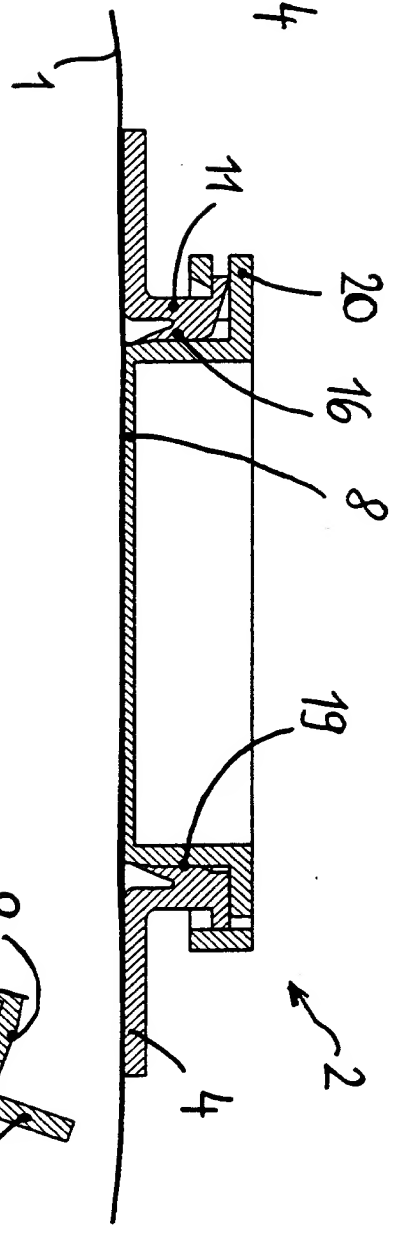


Fig. 5

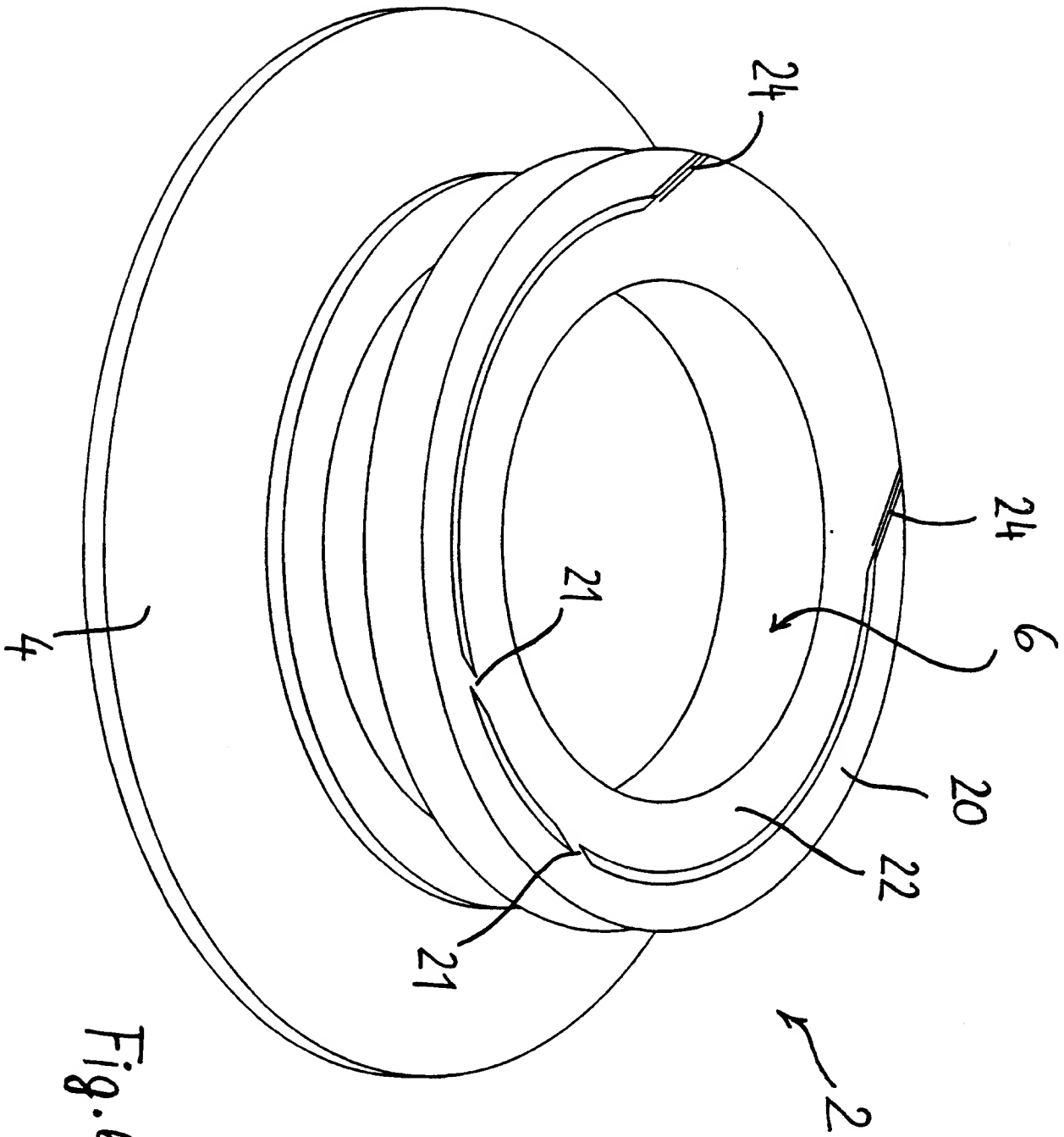


Fig. 6

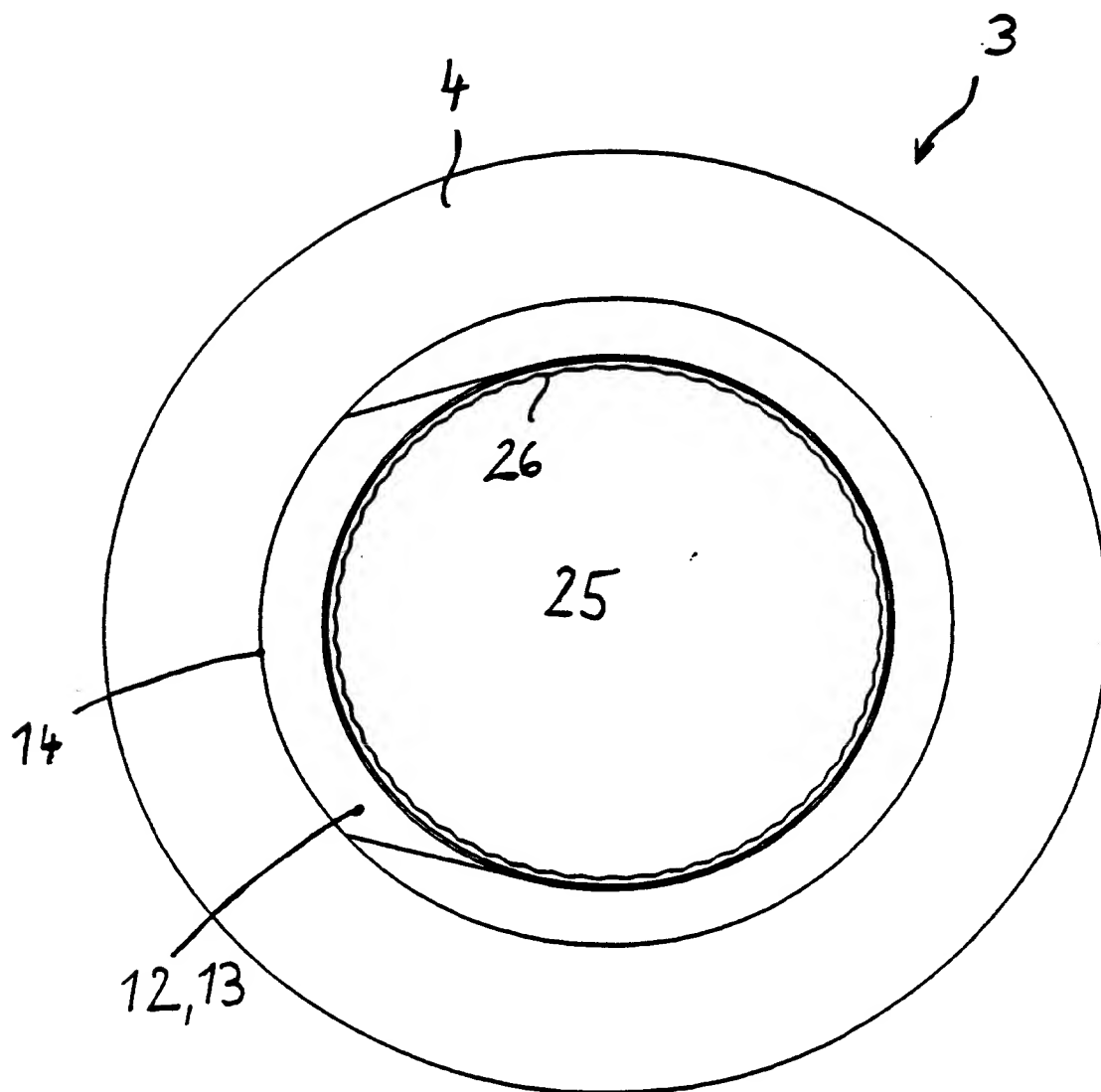


Fig. 7